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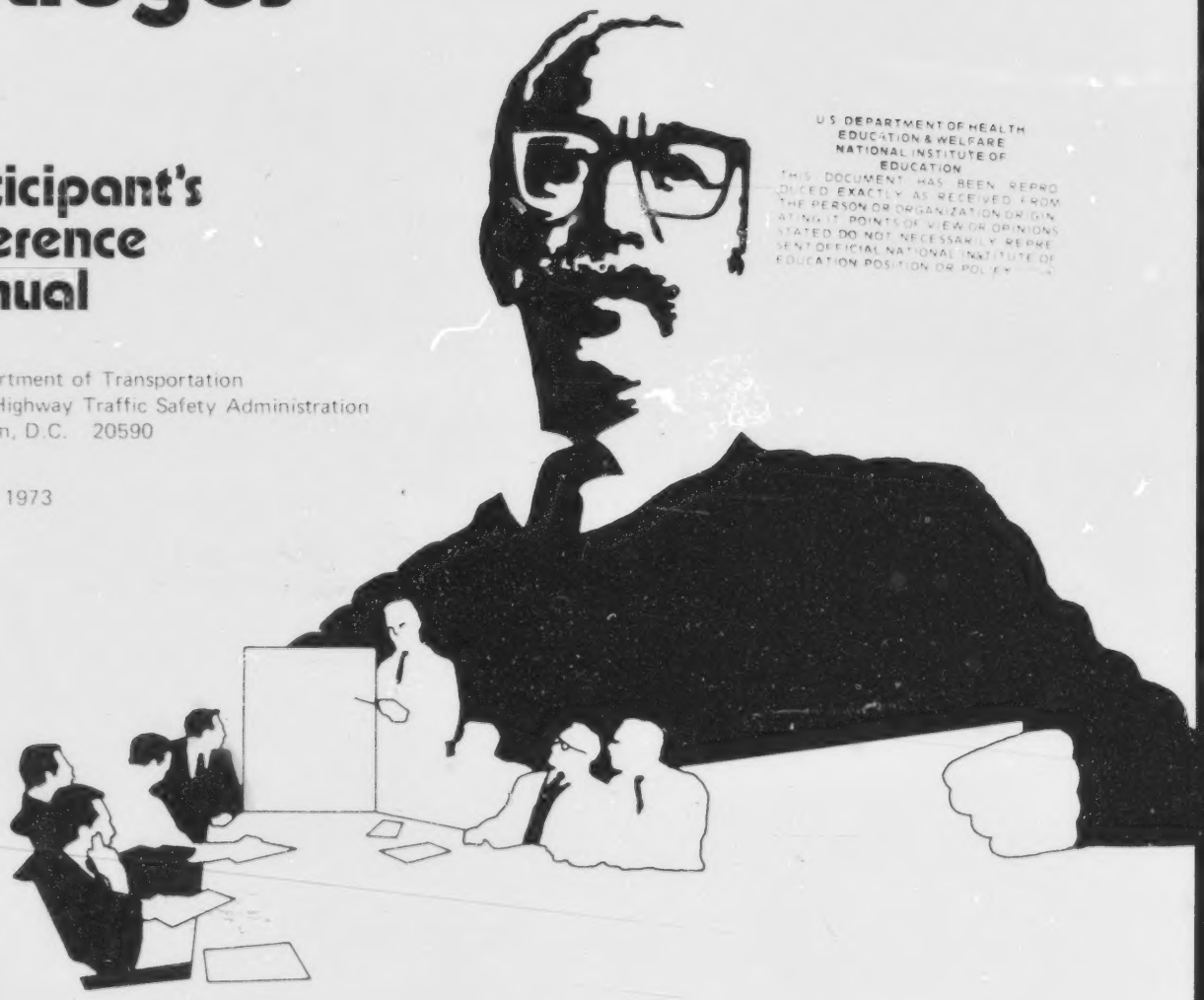
ABSTRACT

The manual contains all the reference manterials to be used by participants in the Highway Safety Workshop. The materials comprise questions and topics for discussion, abstracts of literature related to these topics, and a bibliography. (SA)

Highway Safety Workshop for Traffic Court Judges

SURPLUS DUPLICATE



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Participant's Reference Manual

U.S. Department of Transportation
National Highway Traffic Safety Administration
Washington, D.C. 20590

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Highway Safety Workshop

Participant's Reference Manual

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Definition of the Problem

Question: By whom are traffic violations committed and when do such violations result in crashes?

ASSUMPTION	IMPLICATION	ACTION
Traffic violations are committed by a limited number of drivers who make errors in their driving performance which may result in crashes.	A. People who commit traffic violations were driving irresponsibly. →	A. The judge should see everyone who commits a traffic violation.
	B. If this limited number of drivers were taken off the road, the highway safety problem would be greatly reduced. →	B. One of the judge's primary responsibilities is to take this group of drivers off the road.
	C. The average driver seldom makes mistakes and is not often involved in crashes. →	C. The judge will seldom have cause to see the average driver.

Research Abstract

Source:

Stonex, K.A., "Law, Traffic and Engineering Technology," Highway Research Board Special Report 86: A Colloquy on Motor Vehicle and Traffic Law, National Academy of Sciences - National Research Council, 1965.

Discussion:

The author, an automotive safety engineer at the General Motors Technical Center, notes that we have attempted to legislate regulations for the "proper path and action and conduct of every driver along every foot of the road every minute of the day and night, so that no drivers who follow these definitions, or regulations, faithfully should ever be involved in an accident."

At the same time he reports that since Proving Ground Drivers run off the road once every 24,000 miles because of human failure, it stands to reason that those of us in the general public must fail more frequently.

The author combines the inevitability of human failure with the frightening fact that as we drive a typical 4000-lb. car we guide a "projectile with kinetic energy equivalent to 165 30-06 deer-rifle bullets, or more than one-tenth that of our best anti-tank weapon - possibly the equivalent of a 105-mm. howitzer."

He reports that it is surprising in light of these factors that we do not have more serious accidents.

Conclusions:

The author takes the strong position that the highway traffic fatality problem will not be solved by additional regulations defining proper conduct or by improved enforcement or court procedures.

"Reductions can be made only by recognizing that our highway network does not leave room enough for the occasional unreliability of us drivers...The solution is to remove the obstacles, trees and rocks and sharp ditches, and opposing traffic."

Stonex cont.

Recommendations:

The application of engineering technology to our highways will reduce the number, cost, and severity of accidents. Specifically favored is removing the solid obstacles and converting roadways to one-way operation.

Research Abstract

Source:

Hutchinson, Cox and Maffet, "An Evaluation of the Effectiveness of Televised, Locally Oriented Driver Reeducation," Highway Research Record 292 (1969) cited in

Automobile Insurance and Compensation Study, Driver Behavior and Accident Involvement: Implications for Tort Liability, Department of Transportation, October 1970.

Discussion:

Three researchers from the University of Kentucky studied driver behavior at eight intersections in urban and rural locations in Lexington-Fayette County, Kentucky. Eleven types of driver errors were observed and reported.

The errors were recorded on 16 mm film. The films were subsequently shown on local television.

Prior to the broadcasts, with all of the normal inducements to safe driving present - traffic laws, safety campaigns, and tort liability for accidents resulting from negligent conduct - more than a quarter of the drivers committed an error at the intersection studied.

After the films were televised, the proportion of drivers committing errors dropped only slightly. Over 20 percent of the drivers observed and committed at least one error.

Conclusions:

In spite of the claim by the researchers that the program was a success since it reduced the incidence of both errors and accidents, even the reduced level reflected errors by more than 20 percent of the observed drivers. "At least at intersections, driver errors are common and resistant to change even in the presence of unusual (measures)."

Research Abstract

Source:

Boek, "Automobile Accidents and Driver Behavior," Traffic Safety Research Review (December, 1958) cited in

Automobile Insurance and Compensation Study, Driver Behavior and Accident Involvement: Implications for Tort Liability, Department of Transportation, October 1970.

Discussion:

The New York State Department of Health conducted a "car-following" study by observing a random sample of drivers from another car without the drivers' knowledge for a distance of between one and two miles.

The drivers were scored in 9 areas - such as speed, observation of lane markings, yielding - as "safe" and "unsafe."

The report found that no driver was rated entirely unsafe (committed errors in all 9 areas), 48 percent were judged entirely safe (committed no errors). One half of the observed population operated their vehicle so that at least one error was observed in the one-to-two mile trip.

Research Abstract

Source:

Edwards and Hahn, Filmed Behaviors as a Criterion for Safe Driving, American Institutes for Research (Washington, D.C., February 1970) cited in Automobile Insurance and Compensation Study, Driver Behavior and Accident Involvement: Implications for Tort Liability, Department of Transportation, October 1970.

Discussion:

The American Institutes for Research published a study in February, 1970, describing the behavior exhibited by average urban male drivers.

A sample of 304 white male District of Columbia resident operators was filmed from a following truck. The films were then evaluated by the police officers and a traffic safety expert. The drivers were rated on their performance. The sample was biased toward middle-aged "white-collar" drivers.

The perhaps unexpected result was that the average driver committed more than nine errors (e.g. failure to stay in lane, turning without signalling, speed) in five minutes of urban driving. In addition, the average driver committed nearly four different kinds of errors.

The researchers then viewed the accident records of the drivers before and after the 1962 observation. The average number of errors per driver for the accident-free group was 9.04, while that for the drivers involved in two or more accidents for the prior period was only 11.14. The authors concluded that "the difference, while it does exist, hardly indicates a striking dichotomy with regard to observable behavior behind the wheel between accident-free and accident-involved drivers."

Conclusions:

Considering the bias of the sample in favor of those operators usually considered less likely to be involved in crashes, the number of driving errors is striking.

This study suggests most drivers commit errors regularly.

Research Abstract

Source:

Blumenthal, Murray, "Dimensions of the Traffic Safety Problem," presented to the Automotive Engineering Congress, Detroit, Michigan, January 1967.

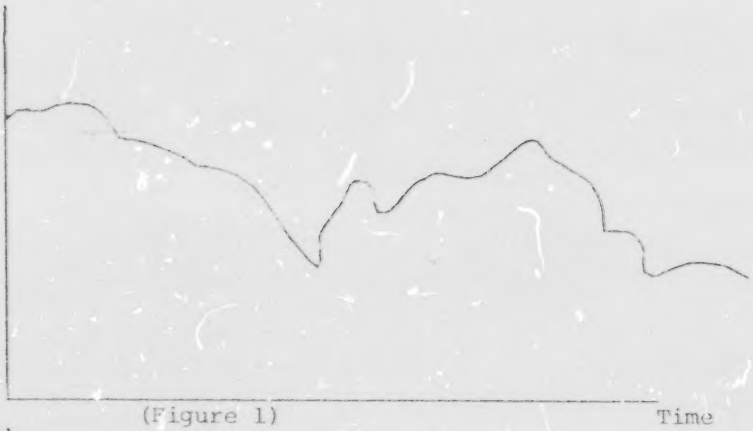
Discussion:

The presentation attempts to place traffic safety in a broader framework than traffic accident statistics which "describe not the problem, but its symptom."

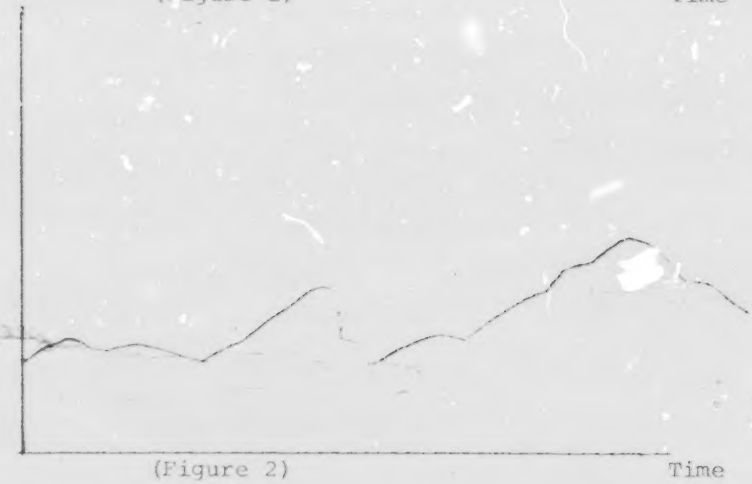
The author proposes that accidents are inevitable when one realizes the imbalance between the technology of the motor vehicle transportation system and the demands made upon driver capabilities. The driver is expected to compensate by his decisions for the vehicle, the highway, and his fellow driver. It is remarkable that he does so most of the time. But every year about 25 percent of all drivers cannot meet the demands made upon them.

Graphically, the performance of a normally competent driver varies - at times he is more or less careful, distracted, fatigued, etc. (Fig.1). The demands made upon the driver vary - poor weather, congestion, uncontrolled access, etc. (Fig. 2). When the system demands exceed driver capability or alternatively, if driver performance does not meet the system demands, an accident occurs (Fig. 3).

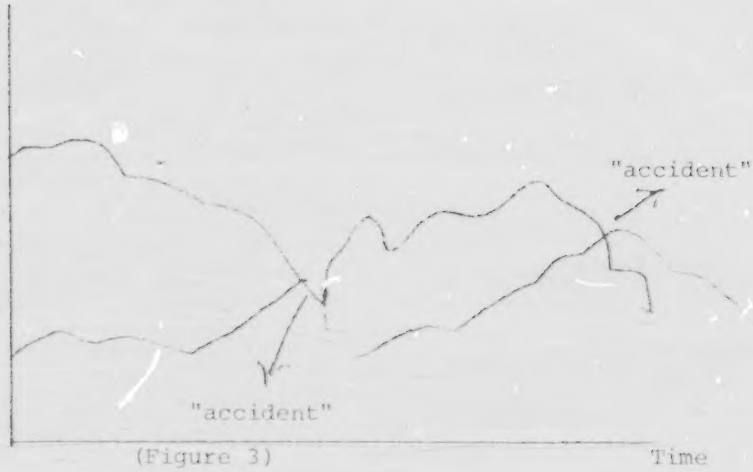
Blumenthal cont.



(Figure 1)



(Figure 2)



(Figure 3)

Blumenthal cont.

Accidents thus become a problem for most drivers. If one considers the performance curves for drivers who are inexperienced, aged, or problem drinkers, the likelihood of an accident is even greater. Modification of the road design - reducing performance demands and increasing the "forgivingness" of the road - inevitably will reduce system failures (accidents).

Conclusions:

In a society which promotes industrial safety under the principle that every type of accident which may occur should be anticipated and safeguards should be provided, the notion that "if only drivers were more careful, accidents wouldn't happen" is inappropriate. Society should promote highway safety by anticipating human failure and therefore providing safer vehicles and less demanding, more "forgiving" roadways.

Recommendations:

Society should recognize that human failure on the highway is unavoidable and predictable. Given the human cost of accidents, society should apply its technological, political and economic resources to the improvement of all elements of the system.

Definition of the Problem

Question: Is it possible to reliably identify and predict who will be involved in crashes?

ASSUMPTION	IMPLICATION	ACTION
There is a high correlation between previous violations and future crashes, i.e., drivers with several violations are very likely to be involved in crashes.	A. It is possible to identify/predict who will be involved in crashes by reviewing individual driver history. →	A. The number of previous traffic violations should be a critical factor in the judge's evaluation of any case.
	B. If all traffic violators with past records were taken off the road, the highway safety problem would be greatly reduced. →	B. The judge should work to identify the repeated traffic violator and take him off the road.

Research Abstract

Source:

Forbes, T.W., "The Normal Automobile Driver As a Traffic Problem," Journal of General Psychology, Vol. 29, p. 471 (1939).

Discussion:

In 1939, Forbes pioneered efforts in determining the relationship between traffic violations and accidents. As a member of Yale University's Bureau for Street Traffic Research, he analyzed the records of almost 30,000 Connecticut drivers between 1931 and 1936.

His studies refute the hypothesis that most accidents result from the actions of "accident-prone" drivers. In fact, if persons with two or more accidents in three years were removed from the road for the next three years, then in those next three years 96.3 percent of the accidents would happen anyway because they would involve other drivers. It is the so-called "normal driver," not the driver with a record of past accidents, who is involved in the overwhelming percentage of the accidents.

Conclusion:

The "normal driver" constituted 98.7 percent of the driver group studied and caused 96.3 percent of the accidents.

Research Abstract

Source:

Peck, McBride and Coppin, Accident Analysis and Prevention, Vol. 2, No. 4, p. 243, 1971.

Discussion:

The authors hoped to determine whether a driver's past violation record was a good predictor of future accident involvement.

Their concern is based on the policy question of whether concentration on the accident repeater through rehabilitative and/or restrictive measures will substantially reduce accidents.

They found that "the low stability index for accidents indicates that the accident population is largely composed of different drivers from year to year... of those drivers who were accident involved in both 1961 and 1962, 87 percent were accident free in 1963. Conversely the previously accident-free drivers accounted for the vast majority of the accidents in 1963."

Conclusions:

Programs focusing on the accident repeater can not be expected to bring about a substantial reduction in accidents because the repeater is only a small part of the problem.

Recommendations:

"This, of course, does not mean that accidents cannot be reduced through selective application of driver improvement action, or that driver improvement programs should be discarded. What these findings do indicate is that selective driver improvement efforts should be based on realistic objectives and evaluated accordingly."

Research Abstract

Source:

State of California, Department of Motor Vehicles, The 1964 California Driver Record Study - Part 4: The Relationship Between Concurrent Accidents and Citations, May, 1965.

Discussion:

In the 1964 study, a random sample of 225,000 California driving records were reviewed. The records were placed on computer tapes and analyzed. To be considered, the subject's record had to be complete for 3 years prior to the study.

This part of the study was concerned with the relationship between a driver's conviction for moving traffic violations and traffic accidents. The report was concerned with the question:

If one knows a driver's record of convictions for moving traffic violations, how sure can he be that the driver has also been involved in a traffic accident?

Conclusion:

There is a low correlation between citation (conviction for moving traffic violations) and accident involvement.

Research Abstract

Source:

Insurance Institute for Highway Safety, "North Carolina Study Finds 'Repeater Theory Weak'," Status Report, Vol. 6, No. 13, July 12, 1971. This article is quoted in full under Discussion.

Discussion:

Most highway crashes involve drivers with no record of traffic violations in the preceding two years, not recent "repeaters," according to a North Carolina analysis.

And, "If you took all drivers with three or more violations in the past two years off the highway and kept them off 100 percent effectively for the whole (next) two years, North Carolina would still experience 96.2 percent of the accidents it would have had anyway," says Dr. B.J. Campbell, Director of the Highway Safety Research Center at the University of North Carolina and the author of the analysis.

(Actually, according to a California Department of Motor Vehicles Study, some 32 percent of drivers whose licenses are suspended and 68 percent of those whose licenses are revoked continue to drive anyway. On that basis, 100 percent effectiveness of driver removal is generally considered impossible by Dr. Campbell and others in the highway loss research field.)

Campbell's study, summarized in the spring issue of "Signal 99," a publication of the North Carolina Governor's Highway Safety Program, was based on an analysis of more than two million North Carolina drivers' records.

Not only did the study find that the relationship between crashes and past violation histories is "weak" for most drivers, it also found that 80.7% of North Carolina drivers who have crashes in a two-year period do not have crashes in the next two-year period.

"...the fact is that the overwhelming majority of people who have an accident in one time period do not have an accident (in) the next time period," said "Signal 99" in characterizing the study.

Insurance Institute cont.

A notable exception to the finding, it added, is the abusive drinker who drives. North Carolina drivers with a history of drunken driving during one two-year period were found to be involved in more accidents than the average driver during the next two years, the publication quoted a state Department of Motor Vehicles statistician as reporting.

Campbell concludes on the basis of this study that highway safety administrators must "modify the belief that the repeater is the main source of trouble on the streets and highways...It is wrong to lead people to believe that by concentrating chiefly on the accident repeater we will make substantial inroads on the problems of traffic safety in North Carolina or the nation."

Conclusion:

The same small minority of drivers does not consistently cause the majority of serious accidents. Each year a substantially different group of drivers is involved in accidents.

Recommendations:

Focusing on the accident repeater will not bring about a large reduction in total accidents.

Definition of the Problem

Question: Who is the problem driver?

ASSUMPTION	IMPLICATION	ACTION
People who drink shouldn't drive	A. Drinking any amount of alcohol seriously effects driving performance.	A. Anyone convicted of drinking-driving should be removed from the road.
People would have significantly better driving records if they started driving at later ages.	B. Age alone is a critical factor in the quality of driver performance	B. Youthful driving offenders should be removed from the road.
The elderly driver drives slowly but safely.	C. Elderly drivers are seldom involved in violations or accidents.	C. The court will seldom have occasion to see the elderly driver.
Drivers with a history of repeated violations are dangerous drivers.	D. Most drivers with a history of violations can be expected to get involved in crashes.	D. All repeater violators should be taken off the road

Research Abstract

Source:

Bacon, Selden D., (ed.), "Traffic Accidents and Violations - An Abstract," Quarterly Journal of Studies on Alcohol: Studies of Driving and Drinking, Supplement No. 4, May 1968.

The abstract is quoted in full below.

Discussion:

In California, a comparison was made of the types of accidents and violations incurred by 256 drivers with alcoholism as a primary diagnosis, 126 drivers with another medical condition and a drinking problem as a secondary diagnosis, 1,319 drivers with other medical conditions and no drinking problem, and 921 drivers with no known medical condition. Alcohol impairment was measured in 33% by blood or breath alcohol determination and in the remainder by a "sobriety field test."

Conclusions:

The following differences in accident and violation patterns were found: (1) 60% of accidents involving persons with primary alcoholism, 30% involving persons with a secondary drinking problem and 10% involving persons with other medical conditions or none occurred after drinking. (2) It is estimated that alcoholic drivers, representing 6.5% of the drivers in California, are responsible for between 41 and 62% of accidents after drinking in the State. (3) Alcoholic drivers were innocent victims in only 1 out of 8 of their accidents, those with another medical condition in 1 out of 3, and drivers with none in 1 out of 2 of their accidents. (4) Accidents in which the driver was drinking but was thought not to be impaired resembled accidents in which the driver was known to be impaired more than accidents in which he was sober, suggesting significant impairment with overt intoxication and, if drinking can be identified, impariment may also be assumed. The need for implied-consent legislation suggests itself.

Bacon cont.

(5) Accidents involving alcohol were more likely to be single-vehicle accidents, or collisions with parked or stopped cars, than accidents during sobriety. Drivers with alcoholism and other medical conditions had a greater proportion of such accidents when sober than drivers in the comparison group. (6) Though no appreciable difference between alcohol and nonalcohol accidents appeared in the number of people injured per accident fewer were at risk in alcohol accidents because more of them involve a single vehicle or parked car...Injuries per number of people exposed would therefore be more. (7) Drinking accidents of alcoholic drivers were distributed throughout the day more evenly than accidents of nonalcoholic drivers, and they were more likely to occur between 6AM and noon. (8) 20% of nonaccident violations by alcoholic drivers were for drunken or reckless driving in comparison with 2% by other groups. (9) Persons with alcoholism and other psychosocial disorders had 1½ times as many violations for vehicle defects as persons with organic medical conditions and persons with none. (10) The proportion of convictions for driving with a suspended or revoked license or without a license in possession was twice as great for drivers with alcoholism as for drivers with other medical conditions.

Research Abstract

Source:

Proceedings of National Highway Safety Bureau Priorities Seminar, Vol. 2: "Alcohol and Highway Safety Countermeasures, Part IV-Identification of Problem Drinkers," Fredericksburg, Virginia, July 18-20, 1969.

Discussion:

Problem drinkers record high blood alcohol levels seldom found in the social drinker. The problem drinker is involved in a significant number of fatal accidents. The seminar hoped to identify several characteristics which might be used to identify the problem drinker.

Conclusions:

Problem drinkers are characterized by:

1) an extremely high blood alcohol level;

   From a third to a half of all fatally injured drivers who have been drinking have blood alcohol levels over 0.15 percent, a level which is found in non-accident drivers less than 1 percent of the time.

2) one or more previous arrests involving alcohol;

   Approximately a third of drivers who are convicted for drunk driving will repeat as offenders.

3) previous contacts with social agencies and medical facilities;

4) medical signs of alcoholism;

   A researcher found that among traffic fatalities with blood alcohol levels of 0.15 percent or higher at the time of their death, 62 percent had cirrhosis and 77 percent had previous arrests and/or cirrhosis. For sober drivers who were fatally injured, 15 percent had cirrhosis and 22 percent had cirrhosis plus previous arrest.

5) a psychological dependence on alcohol;

6) reports of heavy drinking, marital problems and job absenteeism.

Proceedings cont.

Recommendations:

Procedures should be developed to determine if any or all of these characteristics are found in the individual driver. (For example, DWI defendants might be given a medical examination or thorough pre-sentencing reports on drivers might be required. In addition to the identification of the problem drinker as differentiated from the social drinker, the selection of appropriate treatment for the problem drinker might be made.

Research Abstract

Source:

Goldstein, Leon G., "Youthful Drivers as a Special Safety Problem," The Young Driver: Reckless or Unprepared? North Carolina Symposium on Highway Safety, Fall 1971.

Discussion:

For young people between the ages of 15 and 24, motor vehicle accidents are the leading cause of death. This fact raises many questions:

- Are high accident rates a necessary consequence of allowing the young to drive?
- Can we better prepare youth?
- What type of training should be emphasized?

In his article, Dr. Goldstein makes an extensive review of the research on the young driver. He discusses data on the relative contribution of inexperience as opposed to age per se. Finally, he discusses the personality characteristics of the youthful driver as related to driving records.

Conclusions:

Although a controversial finding, Dr. Goldstein concludes that while both inexperience and age per se play a part, experience is perhaps the greater determiner of accident involvement.

He finds young drivers with poor records exhibit personality characteristics that reflect greater hostile, aggressive and impulsive tendencies. He reports that the involvement of alcohol in highway fatalities of young people may not be greatly less than in the case of older adults. Although the role of drugs in accidents involving youth has not been extensively studied, it appears that drugs have a far less involvement than does alcohol. He believes little can be done to change the conditions which make adolescence a turbulent period. In light of this, he stresses efforts to improve the crash worthiness of vehicles and the design of highways.

Goldstein cont.

Recommendations:

Dr. Goldstein urges special programs to improve the performance of the youthful driver; programs based on further research and designed to deal with the modification of those characteristics commonly found in the adolescent drive .

Research Abstract

Source:

Abt Associates Inc., Alcohol-Highway Traffic Safety for Law Enforcement Officials, a workshop manual prepared for the National Highway Traffic Safety Administration (footnotes omitted).

Discussion:

Experts have found that drinking and driving can mix when the drinking is moderate or when considerable time elapses between the period when the person drinks and when he drives. The one or two drinks a social drinker might have before driving are not likely to affect his driving ability significantly.

The degree to which a driver's ability to drive may be impaired is directly related to the amount of alcohol in his bloodstream, or his Blood Alcohol Concentration (BAC). This BAC level is determined by four factors:

1. The amount of alcohol he drinks.
2. Whether the person has eaten before drinking.
3. How much the person weighs.
4. How long the person waits to drive after drinking.

According to the law in most states, a BAC of .10 or higher is presumptive evidence of intoxication. For a one hundred and eighty pound person to achieve a BAC of .10 he must have drunk 5½ drinks - beer or mixed drinks - in one hour or nearly seven drinks in a two hour period. This is the case if he has not eaten in three hours; if he has, it will require more alcohol to reach the BAC level at which he is legally drunk.

Frighteningly, most drunk drivers far exceed the BAC level to be considered merely legally intoxicated. They are excessive drinkers. According to one study, more than half of the people arrested for driving while intoxicated, or DWI, have BAC's over .20. For our example of a 180 lb. man who has not eaten recently, that is eleven drinks an hour. In the same study, over 97% of the DWI arrests were of people with BAC's over .15. At BAC of .15, a person is 25 times more likely to be involved in an accident than if he were sober.

Alcohol cont.

In contrast, the same man, having three drinks, BAC .06, is only about twice as likely to have an accident than when he is sober. Any more than 1½ drinks within an hour of driving will affect a person somewhat, but the degree to which he is affected varies greatly.

Conclusions:

The greatest and most predictable traffic safety danger for society is represented by the excessive or problem drinker. Although the social drinker may have impaired ability, his likelihood of accident involvement is far less than the problem drinker.

Research Abstract

Source:

Campbell, B. J., Report in "Signal 99," North Carolina Governor's Highway Safety Program, Spring, 1971.

The report is quoted at length below.

Discussion:

In any given year in North Carolina, about 200,000 drivers are involved in accidents. This is approximately seven percent of all drivers in the North Carolina driving population. If the same seven percent caused the accidents year in and year out, the State could do something about it. On the other hand, if an entirely different seven percent of the drivers have an accident each year, then the State would be helpless in identifying those who may have future accidents.

The truth is somewhere in between, but the fact is that the overwhelming majority of people who have an accident in one time period do not have an accident the next time period. Indeed, 80.7 percent of N.C. drivers who have accidents in one two-year period do not have accidents the second two-year period.

A study of drivers in North Carolina shows approximately the same situation regarding past traffic law violations and their predictive value in determing who will have accidents. The analysis showed that a person's past driving record is statistically related to future accidents, but the relationship is weak. Indeed analysis showed that most accidents involve drivers who had no records of traffic violations in the prior two years.

The following chart shows the number of accidents experienced over a two-year period by drivers with varying numbers of traffic violations during the preceding two years. The chart shows the difference in the accident experience of drivers with many violations and those with few or none, but this difference accounts for only a small portion of the accident toll. If all the drivers with three or more violations in the past two years were removed from the highway and kept off 100 percent effectively for two years, North Carolina would still experience 96.2 percent of the accidents it would have had anyway. Moreover, of the drivers removed, 71 percent would not have been involved in an accident.

Campbell cont.

VIOLATIONS IN YEARS 1 & 2	ACCIDENTS IN YEARS 3 & 4: 0	1	2	3	4	TOTAL
0	1,890,951	185,069	18,451	2,094	370	2,096,935
1	247,266	43,379	6,759	1,012	229	298,645
2	56,457	13,407	2,693	532	127	73,216
3	15,862	4,647	1,078	247	73	21,907
4	8,124	2,539	680	143	51	11,537
TOTAL	2,218,660	249,041	29,661	4,028	850	2,502,240

Conclusions and Recommendations:

Dr. Campbell feels that all levels of traffic safety administration must modify the belief that the accident repeater is the main source of trouble on the streets and highways.

"The accident and violation repeater is a small part of the overall accident problem, and the state should (and does) have programs to deal with these people. But the great bulk of the accident problem lies with essentially 'normal' people who have accidents, and it is in this area that the bulk of our progress must come."

This would include information that would help the individual driver sharpen his skills, highway directive and warning signs and adequate markings that are easily understood, and cars designed and compatible with the human operator.

Research Abstract

Source:

North Carolina Symposium on Highway Safety, "Aging and Highway Safety: The Elderly in a Mobile Society," Fall 1972 (unpublished).

Discussion:

On October 17 - 18, 1972, a symposium was conducted by the University of North Carolina Highway Research Center. The symposium discussed the rights of the older driver and pedestrian as they relate to society's need to impose limitations on the exercise of those rights.

The discussion dealt with two important factors: (1) the elderly's decreasing physical vigor and sensory activity and (2) the increasing performance demands of the modern highway system. These factors confront the need of the age for mobility and the need of society to protect itself.

Conclusion:

Society should determine effective means of dealing with the aging driver. For example, licenses for the elderly which restrict their driving to specified conditions might be appropriate or periodic re-examination of driving skills might be required.

Research Abstract

Source:

Abt Associates Inc., Alcohol-Highway Traffic Safety for Law Enforcement Officials, a workshop manual prepared for the National Highway Traffic Safety Administration (footnotes omitted).

All studies are summarized in the 1968 Department of Transportation Report to Congress entitled "Alcohol and Highway Safety."

Discussion:

Research has indicated that alcohol involvement by drivers and pedestrians is responsible for more deaths and accidents on the highway than any single factor. Specifically, drinking drivers and pedestrians contribute directly to about half of all traffic deaths and injuries. Most of these deaths, however, are not primarily the results of actions by what is commonly known as the "social drinker," but by the driver who drinks to great excess, the so-called "problem drinker." Alcoholics and other problem drinkers, who constitute less than 10% of all licensed drivers in the United States, account for a very large part of the overall problem. It appears, in fact, that two-thirds of those drinking drivers who are involved in accidents are problem drinker drivers.

Problem drinker drivers are those who have more than one arrest for offenses involving alcohol (including non-highway arrests) who are known to the various health and social agencies in their communities, and who often have a history of troubled relationships with their employers, their families, and their bank or creditors.

Most research indicates that there are about seven million plus problem drinker drivers on the highways today who are the primary hazard in terms of alcohol-related crashes; that is, one driver out of every 15.

Who are these drinking drivers? By and large they are not social drinkers. True, the social drinker sometimes gets really drunk and drives. Sometimes he kills people that way. But generally the social drinker does not drive at BAC levels like those of the people arrested for DWI.

Alcohol cont.

In a series of studies, drivers passing the places where accidents had taken place, at about the same time of day and week as the accidents, were stopped and their BAC level was measured This should indicate what percentage of drivers were legally intoxicated at the time of the accident. An average of 2% of the drivers tested had BAC's in excess of .10. In contrast, between 29 and 50% of the drivers killed in car crashes had BAC's in excess of .10. In short, we are not dealing here with the social drinker who has a couple of drinks and drives home. We are dealing with drinkers who have been consuming great quantities of alcohol in a short period of time.

What careful studies have shown is that more than two-thirds of alcohol related fatalities involve so-called problem drinkers. That is over 28,000 deaths each year.

It is these alcoholics and other problem drinker drivers who are responsible for most of the alcohol-related accidents. For example, one study revealed that 80% of those arrested for DWI had histories of drinking problems, 60% had more than one previous alcohol-related arrest; and 35% had more than four. Most drivers arrested for DWI are not social drinkers who happen to have "one too many"; they are drinkers who regularly or frequently get drunk - and then often drive afterwards.

Conclusion:

There is a need to remove alcoholic and problem drinker drivers from the road.

Definition of the Problem

Question: What is the effectiveness of education and rehabilitation countermeasures in correcting the driving performance of traffic violators?

ASSUMPTION	IMPLICATION	ACTION
The driving performance of traffic violators can be corrected through instruction in better driving skills and attitudes.	A. Education and/or rehabilitation countermeasures are effective in reducing violations and therefore crashes. ⟶	A. The judge should impose education and/or rehabilitation countermeasures on the traffic violator.

Research Abstract

Source:

State of California, Department of Motor Vehicles, "An Abstract of the Effectiveness of a Uniform Traffic School Curriculum for Negligent Drivers," June 1971.

(The abstract is quoted at length below.)

Discussion:

The traffic violation repeater has been of concern to driver's licensing authorities and traffic safety administrators for many years. As a result, a variety of driver improvement programs has been implemented throughout the country in an attempt to rehabilitate and/or control the problem driver.

How successful are these driver improvement systems? In the case of court-mediated traffic school programs, very few evaluative studies have been reported and most of these are marred by serious methodological deficiencies. Evaluation has generally consisted of comparing driver records before and after subjects have attended traffic school without using a comparison or control group. One study reported that a 27 percent reduction in traffic convictions and a 40 percent reduction in accidents were found for subjects who attended a driver improvement course. Without a comparison or control group, however, it is impossible to assess whether these subsequent changes in driving record were due to traffic school or incidental factors such as experience, maturation, other treatment programs, statistical regression, etc.

The present study represents an attempt to establish the basis for an effective court-mediated educational program for problem drivers.

Conclusions and Recommendations:

The study was designed to evaluate the effectiveness of a uniform traffic school curriculum developed for the traffic violation repeater. The evaluation indicated that attendance at the school resulted in an overall 11.8 percent reduction in accidents and a 6.2 percent reduction in convictions for male drivers. In addition, the effectiveness of the traffic school was found to vary according to the type of driver treated. For females and certain male subgroups, there

California Traffic School cont.

was no evidence that traffic school resulted in driver improvement.

Cost effectiveness figures showed that the traffic school resulted in savings of $3,807 per 100 male drivers, which is substantially less than that achieved by a one-session group educational meeting given by the Department of Motor Vehicles. Therefore, lengthy traffic school courses should not be considered desirable alternatives to one-session group educational meetings, nor should they be implemented on a state-wide basis without further modifications to improve cost effectiveness. These modifications might include (1) shortening the length of the course, (2) modifying course content to improve those types of drivers who did not benefit from the course, and (3) focusing only on those drivers who benefited from the course. The authors feel that a more systematic approach would be to utilize the more extensive court school programs for those drivers who continue to violate after having already received a warning letter and attended a group meeting. However, implementation of an integrated state driver improvement program will require greater coordination between DMV and the courts than has existed in the past.

Research Abstract

Source:

Klein, David and Julian A. Walker, Causation, Culpability and Deterrence in Highway Crashes, Department of Transportation, Automobile Insurance and Compensation Study, July 1970.

Discussion:

The text summarizes the most recent literature in the field to assess how the various investigations might bear on the policy issues involved in the automobile insurance system. Chapter 6 is entitled "The Efficacy of Educational and Environmental Countermeasures." The following abstract is concerned with driver education for the new driver.

The authors view educational countermeasures as an alternative to the punitive approach. The first seek to change individual behavior, the later to punish the offender.

High School courses consisting of classroom education and behind-the-wheel training are widespread. A crucial issue is whether students who have successfully passed a driver education course have fewer or less severe crashes or fewer violations than those who have not. According to the authors, much of the research - which they find to be methodologically of poor quality - claims the course graduates do have better records. The insurance industry reinforces these claims.

The reviewers suggest that the relationship between driver education and subsequent performance is statistical association and that the driver education itself does not necessarily produce better records.

The research is criticized for using as subjects student groups already divided into those planning to take the course and those not so planning. Rather than the driver education course, it may be special characteristics of those who want to take the course which account for their subsequent records. Next, the research supporting driver education does not compare both the quality and the

Klein cont.

quantity of the exposure of the two groups. Perhaps the driver-educated group drives far less miles after the course. Thirdly, the follow-up period for comparisons is often short so that it is unclear how lasting the effect of the courses may be. Finally, each study is peculiar to the education program devised for the locale in which it is administered. To generalize from such studies may be inappropriate.

More rigorous studies, where the exposure factor was controlled, found that education courses per se do not produce lower crash or citation frequencies.

Conclusion:

The authors find "no acceptable research" which credits driver education with a significant role in the reduction of violations or accidents.

Research Abstract

Source:

State of California, Department of Motor Vehicles "An Abstract of Modifying Negligent Behavior: Evaluation of Selected Driver Improvement Techniques," March, 1971.

Discussion:

In California, as elsewhere, each year large amounts of money and manpower are expended on programs aimed at the negligent driver - the driver who is habitually involved in collisions and convictions. This study evaluated the effectiveness of various driver improvement programs, including:

Warning Letter - Each subject in this group was sent a standard warning letter which was then being used as part of the regular driver improvement program.

Group Meeting - Each subject was scheduled for and sent an "invitation" to attend a group treatment session (only about 50 percent actually attended). All group sessions were conducted by eight special driver improvement trainers.

Individual Hearing - Each subject was scheduled for an informal hearing and sent a notice to appear. If he did attend the hearing (and over 80 percent did) the department's regular procedures were used to determine what action was taken. If the subject was found negligent, recommendations were made regarding the subject's license; the options ranged from a warning to revocation.

Data on each subject's driving record was coded for the three-year period prior to and for one year after his selection; this information, together with some estimates for the cost of collisions and programs, is the basis for comparison of the various programs.

Conclusions and Recommendations:

As a first contact for negligent drivers, the group meetings are successful in reducing the collision rate for both men and women. While the group meetings resulted in only a small reduction of collisions for men, it is the only pro-

California cont.

gram studied which was at all promising for male drivers. For women there were several programs which resulted in lower collision rates, one of which is the group meeting;the others include the individual hearings (most effective) and warning letters.

A follow-up hearing is useful for those male drivers who continue to accumulate convictions and collisions after their initial program (group meeting, warning letter, etc.). Such a follow-up hearing results in further collision reduction. This was interpreted as support for DMV's practice of progressing from mild to more severe actions when a driver continues to be involved in collisions and traffic convictions.

Cost/benefit results indicate that the best program combination from a collision reducing standpoint (group meetings for males and individual hearings for females) would produce a net savings to the people of California of over 3.7 million dollars a year. Using the group meetings for both sexes produces a slightly smaller net savings of about 3.4 million dollars.

"More Than A Minute"

The group presentations and discussions we have just completed have clarified to some extent our understanding of the problem of highway safety. Perhaps it has placed this problem in a new perspective. We have seen that violations and crashes do not involve only a limited number of bad or "accident-prone" drivers. Rather they involve the normal or average driver who often commits errors and who often finds that the demands of the road exceed his capabilities. We have suggested that removing the habitual violator from the road will not greatly reduce our highway safety problem. We have considered research that indicates that the problem drinker may fall into several categories - the excessive drinker, the young and inexperienced, and the elderly. These findings suggest a need for reexamination of our present court practices and the use of our resources.

In the reexamination - in light of our discussion earlier today - we must not forget that regardless of scientific studies or new theories, you remain with the difficult task of final decision-making when a traffic offender appears in your court. You are placed in a position of complex responsibilities - a position of multiple demands:

1) to increase respect for the courts and the administration of justice;
2) to select sanctions appropriate to individual traffic law offenders - particularly sanctions involving correction and rehabilitation where punishment is inappropriate; and
3) To reduce the incidence of traffic violations and the incidence of accidents resulting from those violations.[1]

Given these demands, yours is a position of continuing frustration. For, as you strive to fulfill these varied responsibilities, you can not help but note that the highway statistics - deaths, property damange, injuries and violations - constantly increase. With this in mind, let us reexamine the demands made upon you. Let us consider possible conflicts between them and the consequences of such conflict. And let us then discuss what approaches might be taken in meeting these demands and fulfilling responsibilities.

First, we have said that society demands that the traffic court judge increase respect for the courts and the administration of justice. The traffic offender - whether or not his actions resulted in a crash - has historically been placed within the jurisdiction of the criminal law. In doing so, society has made the judgment that each individual offender - as with any other criminal defendant - should come before the court for the determination of guilt or innocence and the choice of a sanction. In this appearance, he must be given the full range of due process.

In coming before the court, the individual expects a fair and just treatment. As stated by Judges Berg and Samuels of the Chicago Municipal Court:

> For more than ninety per cent of the Americans who come into contact with the courts, their appearance in traffic court is the only occasion they will have to personally observe the administration of justice...The well-demonstrated truth of the matter is that what happens to the citizen in the traffic (court) can and will influence his attitude toward law enforcement, toward the entire judicial system, and toward the entire system of laws and justice...The increase in respect for traffic laws creates (as) an inevitable by-product, respect for all laws and the administration of justice. At the same time, this increase in respect for the traffic laws carries with it the promotion of traffic safety through greater voluntary compliance with the rules of the road.[2]

Conversely, a poor experience in court can reduce respect for the law and the administration of justice. In a crowded, urban lower criminal court in Connecticut, researchers found that 72% of all criminal cases are handled in one minute or less.[3] Such an appearance can not be calculated to generate respect for the judicial system under any conceivable circumstances. Obviously, this situation does not exist in all our courts and it may not apply to any of the courts represented here. But for the moment, let us assume that such a court did exist - a court with extremely overcrowded conditions - and that we have been asked to recommend approaches and solutions to its problems.

First, let us consider the time and effort expanded in the court appearances of a large number of drivers - the average drivers - who might be dealt with by any other means.

From the studies reported today, it seems that the so-called "accident-prone drivers" or "habitual offenders" do not account for most accidents. A large number of convictions in his past record does not necessarily indicate that any individual will be involved in future accidents. It is the normal, or average, driver who is involved in most accidents.

As early as 1939, T. W. Forbes, a member of the Yale University Bureau for Street Traffic Research, concluded that:

> the 'normal' driver constituted 98.7 percent of the driver group studied and caused 96.3 percent of the accidents which interfered with the efficiency of traffic in that (Connecticut) state.[4]

In 1971, B. J. Campbell, of the University of North Carolina Highway Safety Research Center, came to essentially the same conclusion. Normal drivers, those with no record of traffic violations in the preceding two years, are involved in most highway crashes. In words echoing those of 32 years before, he said:

> If you took all drivers with three or more violations in the past two years off the highway and kept them off 100 percent effectively for the whole (next) two years, North Carolina would still experience 96.2 percent of the accidents it would have had anyway.[5]

The North Carolina report, as one of your own groups reported earlier, did find an exception - the abusive drinker who drives. Drivers with a history of drunken driving are more likely to be involved in future accidents than the average driver.

If it is the normal driver who is involved in most accidents, and if the overwhelming majority of people who have an accident in one time period do not have an accident in the next time period, one must ask if it is sensible to

devote equal court resources to every violator. A related question follows - should the court concentrate its resources on certain types of offenders?

Two professors of law addressed themselves to these questions in a recent study. Generally, it is assumed that requiring the offender to appear in court is a highly effective means of influencing his future driving behavior. However, research indicates quite a different conclusion - that a required court appearance may not effect subsequent driving records any more than paying a standard fine by mail, receiving a warning ticket, or the opportunity to choose between a court appearance and the payment of a fine to a bureau. In their study published in February, 1973, the two professors of law concluded:

> We could find no clear advantage in subsequent safety records of drivers required to appear in court...compared with those processed by the typical violations bureau system prevailing in Denver or with the alternatives - the mailed fine and the warning - introduced temporarily into Denver by this study.[6]

Given these findings, it does not seem reasonable to expend the same amount of judicial resource on every violator, for we know that some violators present more risk than others and that in most cases appearance or non-appearance does not affect subsequent driving behavior.

Where then, should the court concentrate its resources? Obviously, upon the problem driver - those we have identified as requiring special attention. The concentration of time and effort upon these drivers will allow the court to relieve its overburdened docket and devote more time to the individual offender.

By allotting more time and effort to the drivers that do appear in court, the judiciary can better meet each demand made upon it by society - to increase respect for the courts and the administration of justice; to select individualized rehabilitative sanctions; and to effect accident reduction. For the moment, let us consider the practical issues raised by reducing the court case load to allow for this concentration of resources. At a later time we will discuss how this concentration of court time and resources upon certain offen-

ders will respond to society's demand for a reduced incidence of traffic violations and resulting reduction in accidents.

The primary question now is the ever-present "How?". How might this reduction of the court case load be accomplished? There are models for this process which may be modified to match the needs of any jurisdiction and to respond to the suggestions currently under discussion on a national basis.

The changes required to reduce an overloaded docket need not be radical. A wide range of examples exists which would enable the judge to select cases for his adjudication. He could allocate responsibility to referees to hear certain cases with the understanding that their decisions would be subject to his review. He could determine guidelines for clerks to use in assessing fines. He could establish a traffic violations bureau that would deal with certain types of minor offenses. If such a bureau already existed, he could extend its authority to handle a wider range of offenses. In all these examples the judge maintains control of the selection of which types of cases require his special attention.

Another alternative model was put into effect on July 1, 1970, in New York State. All minor traffic cases occurring in New York City, that is, violations other than misdemeanors such as driving while intoxicated or reckless driving, are heard by traffic bureaus. The system annually removes nearly 1,000,000 traffic summonses issued for moving violations in New York City from the criminal courts, leaving the judiciary with the time and capability to hear major violation charges.

This model uses the latest computer-based information systems. If an offender does not wish to contest his case, he may plead guilty by mail or in person, or even plead guilty but make an explanation of the surrounding circumstances. With such a plea, a fixed fine is paid. This process has been limited to minor offenses by individuals with a good driving record. More serious offenses or those in which there is a possibility of a license suspension require a personal appearance.

Ninety-three percent of the cases have been found to use the automatic fine. Seven percent enter a plea of not guilty and in each case a hearing is scheduled by a central computer to reduce demands on officer time. At the time of the hearing, the hearing officer has available a print-out of the driver's record. If a driver does not appear after one warning, the computer system places an automatic block against the driver's license which prevents its renewal. The hearing officer can impose the sanction without delay. For example, the hearing officer can immediately suspend a license by use of a computer relayed message to the Department of Motor Vehicles.[7]

There can be no question of the power of legislative bodies to decriminalize those acts which were earlier placed in the categories of crimes; as New York has done. At present, New Hampshire, Minnesota, New York, Wisconsin and Pennsylvania have laws in effect which make most moving violations "less than a fully criminal act." New Jersey and California have modifications of decriminalization legislation. Many states and local areas characterize the traffic violations as only "quasi" criminal, thus aiding the courts to develop systems to divert routine cases.

Recognizing the problems of the traffic court, the National Highway Traffic Safety Administration of the Department of Transportation has proposed a revision of Standard No. 7, Traffic Courts, promulgated under the Highway Safety Act of 1966. The proposal focuses on the coordination of traffic offense adjudication in the form of administrative staff; use of advanced case management techniques for timely reporting; and processing of certain traffic offenses as non-criminal violations. These proposed standards are indicative of a growing concern for the more effective and efficient operation of our traffic courts.

Regardless of your opinion of the models just presented, you will agree that, as judges, you are asked to do an often impossible task. So long as each violator is required to appear before the court, some judges will be forced to deal with unreasonable volumes of cases, straining their time and energy, and will be unable to devote their efforts and professional expertise to the relatively few, but all important, cases that will make the greatest impact on highway safety.

This is not to say that each of you must perform "radical surgery" on your present court systems. Each court varies in workload both in number, and type of, cases. Your expertise will dictate the model best suited to divert cases from your courtroom docket and the numbers you must divert to enable you to devote maximum resources to those areas where your judgments will have maximum positive effect.

The time has now come when your efforts, your experience and your expertise must be directed toward those selected identifiable drivers who will benefit from the judicial process. Such direction and concentration of your efforts will inevitably increase respect for the judiciary and will become a critical element in the solution of our highway safety problem.

Footnotes

1. Arthur Young and Company, "A Report of the Status and Potential Implications of Decriminalizations of Moving Traffic Violations," Department of Transportation, National Highway Traffic Safety Administration, December 15, 1972, p. 123.

2. Raymond Berg and Richard Samuels, "Improving the Administration of Justice in Traffic Court," De Paul Law Review Vol. 19, p. 503, 1970 cited in Institute for Research in Public Safety, Highway Safety Research: Improved Disposition of Traffic Cases, Reference Volume I, Indiana University, September 1, 1972.

3. Maureen Mileski, "Courtroom Encounters: An Observation Study of a Lower Criminal Court," Law and Society Review May 1971, p. 479.

4. T. W. Forbes, "The Normal Driver as a Traffic Problem," Journal of General Psychology Vol. 29, p. 471, 1939 cited in Automobile Insurance and Compensation Study, Driver Behavior and Accident Involvement: Implications for Tort Liability, Department of Transportation, October 1970.

5. Insurance Institute for Highway Safety, "North Carolina Study Finds 'Repeater Theory Weak'," Status Report Vol. 6, No. 13, July 12, 1971.

6. Murray Blumenthal and H. Laurence Ross, Two Experimental Studies of Traffic Law, Volume II: The Effect of Court Appearance on Traffic Law Violators, Final Report, Department of Transportation, National Highway Traffic Safety Administration, February 1973.

7. Institute for Research in Public Safety, Highway Safety Research: Improved Disposition of Traffic Cases, "Summary Volume," Indiana University, September 1, 1972, pp. 15-17.

"Proven Effective"

If you were a physician, I doubt that you would administer a medicine under ordinary circumstances if you did not know it was effective and if you feared it might have harmful side effects.

Yet, just now, you have completed an exercise in which it became apparent that there was no general agreement on the most effective countermeasures to be used in a given situation. In many instances, we have little real data on the results of particular countermeasures and their effect on highway safety. It must be assumed, then, that the decision as to which sanction to impose is made on the basis of personal experience and preference, rather than on an objective knowledge of the influence of the sanction on the traffic violation.

The so-called professionals - the research and evaluation experts - do not always do better. But they start from the assumption that there is a need to know.

They ask these questions:

> Is the measure effective in reducing the possibility of future accidents?
>
> Could another measure accomplish the same result at less cost?
>
> Has the measure chosen either positive or negative side effects which were not foreseen?

One such area of investigation dealt with countermeasures for first offenders convicted of driving under the influence of intoxicating liquor. With the assumption that we all accept the need to investigate - though we may and should question the results, we would like to report on this

study and several other efforts. At the conclusion of this workshop, a list of the studies cited will be provided for those interested in more detailed reading.

Through the support and interest of the Presiding Judge of the Denver County Court, among others, a study was designed to determine scientifically the effects of a fine versus conventional versus rehabilitative probation on the subsequent driving records of drivers found guilty of a first offense of driving under the influence of alcohol (DUI).[1] Following a conviction for DUI, the defendant could be assigned to one of the following groups:

- A fine which could range up to $1,000 at the judge's discretion. Typically, judges would impose a fine of about $125.
- Conventional probation supervised either by citizen volunteers or staff probation officers with the probation period also at the judge's discretion and ranging up to one year. Typically, six months probation was imposed.
- Conditional or rehabilitative probation in which all defendants found guilty, as a condition of probation, would participate in one of the following treatments or programs routinely used by the Probation Department and prescribed in each case by the judge with a recommendation from the court's diagnostic clinic:
  - A course on alcohol problems, given two evenings per week for three weeks at Metropolitan State College, and sponsored by the State Health Department and other agencies. In ordinary practice, this is the second most frequently used program in conditional probation.

- Outpatient treatment for alcoholism at Denver General Hospital. In ordinary practice, this is the most commonly used therapy in conditional probation.

- Inpatient treatment at Fort Logan Mental Health Center for a minimum of one week, followed by outpatient treatment for the balance of the probationary period. This treatment is infrequently used.

- An alcoholism treatment release program through the Denver County Jail. This is an extreme probationary treatment and is rarely used for the first offenders.

As you will note - these are the very countermeasures (or sanctions) you were asked to rate.

Judges were asked to assign all subjects convicted in a given month to the same treatment group. For example, anyone convicted in January 1969, was to be fined; February, 1969, given conventional probation; and March, 1969, given what has been broadly described as rehabilitative probation. The month-by-month rotation went from January 1969 through March 1970. Lest you fear that a researcher was now the adjudicator, the experimenters stipulated that judges would be free to vary the quantity of the prescribed penalty to fit the individual case, and that in exceptional cases, some other penalty, such as jail, could be used.

The researchers found that judges were not following the agreed schedule of countermeasures - and a study of the different degrees of effect of the sanctions would be impossible as originally planned. Instead, statistical controls - basically re-groupings and control for certain

characteristics - were used. All groups' records were reviewed for one year after conviction.

The startling results were, to quote the study:

> in neither the original treatment groups nor the groups created by the judges' actual sentences were there found any significant differences in subsequent crashes, moving violations (not associated with crashes), points, DUI convictions, or time to first subsequent crash or moving violation. Those drivers sentenced to jail rather than to one of the prescribed treatments were also found not to differ from the balance of the group in subsequent records.[2]

The experimenters concluded that there was no evidence under the conditions of their study that any of the different sanctions studied were found to produce superior results in terms of subsequent driver record and thus there was no clear reason for selecting one sanction over another.

A clear finding was that if an offender was represented by a lawyer, the judge was more likely to deviate from the scheduled penalty by giving a fine to a represented client. Represented defendants could expect far more favorable dispositions of their cases:

> the likelihood of having their charges reduced was 22 times greater than for unrepresented defendants, and the likelihood of being found not guilty or of having charges dismissed was almost four times that of unrepresented defendants.[3]

The researchers conclude:

> Without further evidence, or without providing for scientific program evaluation, it may be needlessly wasteful for courts

> to develop rehabilitative programs involving probation, courses in alcohol problems, outpatient treatment, etc. Considering costs in relation to demonstrated benefits, a court would do best to apply the simple, revenue generating fine which is uncomplicated to administer and is the most popular sanction among defendants and lawyers. We do not see the use of the fine as an ultimate answer, but as a stop-gap until research supports the adoption of more effective alternatives.[4]

The authors do not suggest that judges live in a world where nothing is effective or that it makes little difference what we do. The report ends with specific recommendations for further evaluation that will lead to a selection of the most effective countermeasure.

A different approach in research design for evaluation of countermeasures was followed in North Carolina.[5] Rather than attempt to evaluate an entire system of sanctions applied to persons convicted of a first offense of DUI as in the Denver Study, the Highway Safety Research Center of the University of North Carolina tried to evaluate the effectiveness of one specific 1969 change in North Carolina law - an option to the judge of granting some of those convicted a limited driving privilege, whenever a need to drive is indicated, in lieu of the mandatory revocation of their license.

Before discussing the results of the evaluation study, it might be interesting to note that one of the reasons for the change in the law may have been an earlier evaluation study on the effectiveness of license suspension and revocation. In 1965, two researchers in California - Coppin and Van Oldenbeek - found evidence that 33 percent of a group whose licenses had been suspended and 68 percent whose licenses had been revoked continued to drive with sufficient frequency to incur a subsequent violation or have an accident.[6]

Given the fact that authorities are reluctant to impose mandatory license revocation because of the severity of the penalty; given the fact as shown by Coppin and Van Oldenbeek, that once imposed it may be ignored; and given the real - and alarming fact - as reported today - that such drinking drivers are involved in numerous accidents, the North Carolina legislature allowed upon a first conviction,

> a limited driving privilege or license to the person convicted for proper purposes reasonably connected with the health, education and welfare of the person convicted and his family.

The driver is issued a license with the specific conditions of days, hours, types of vehicle, routes, geographical boundaries and specific purpose.

The North Carolina Department of Motor Vehicles then asked two questions:

1) How are the courts' adjudicating DUI cases given the previous reluctance to convict for DUI and the previous tendency to amend the complaint to a lesser offense without mandatory license revocation?

2) Has the amendment affected the subsequent driving record of those arrested for DUI and granted a limited driving privilege?

The researchers reviewed the records of groups convicted before and after the statutory change and then examined both disposition of their cases (guilty, amended complaint to a lesser charge, not guilty, dismissed) and subsequent driver records. The study looked at driver records one year after the original DUI citation - the same follow-up period used in the Denver study.

The data showed that after the amended statute, there was an increase in percentage of DUI convictions by the courts. Thus, through hard evidence, the legislature, the courts, and the Department of Motor Vehicles were able to see a trend they had predicted - a measurable change in the likelihood of a court conviction for DUI once judges had the option of the limited driving privilege.

In addition, the statutory change to limited driving privileges appears to have a positive side effect. Drivers convicted of DUI could drive legally when it was of necessity, rather than flout the law by driving under suspended or revoked licenses.

In the following year the group that was granted the limited licenses did not have any more accidents and had even fewer violations than the average North Carolina driver. If there is merit in allowing people to drive when it is necessary, then the program seems to be successful, for the limited privilege group is no greater a risk than the average driver. If one believes that a person convicted of DUI should not be allowed on the road at all (hypothetically reducing the risk of his accident involvement to zero), then the program can be criticized. Certainly the continuing use of limited licensing requires further evaluation, but this initial study indicates the potential usefulness of the evaluation and comparison of a broad range of countermeasures.

Recently a bill submitted to the General Assembly of the State of Colorado called for driver education in the public high schools and driver improvement courses for reinstatement of licenses. It specifically called for the State to provide funds for "the scientific evaluation of the effectiveness of the major programs of this article at regular intervals not to exceed five years." The effectiveness of a program is determined by the extent to which the program is instrumental in reducing traffic violations and crashes. That determination - the degree of effectiveness - is what we should ask about each sanction we employ.

You may ask, "How can we initiate evaluation programs for our courts? What resources are available?" The Department of Transportation has set aside funds for evaluation purposes and can assist in financing such studies. Requests for this assistance can be made through the Governor's Representative for Highway Safety.

There are many potential resources for the actual design and development of evaluation programs. University research teams have special expertise in this area and could offer assistance in state and local evaluation programs. Many private research organizations have extensive evaluation experience and are seeking opportunities to apply evaluation techniques to areas of public concern. Regional or statewide judicial committees could recommend joint efforts with appropriate university or private organizations.

All of us accept the premise that the role of a traffic court judge is critical to the effective solution of the highway safety problem; that the judge is the key to the solution's success or failure. Therefore it is apparent that you must use your resources in those areas of maximum effectiveness. All of you are leaders in your field; all of you have superior capability to develop new and innovative countermeasures. Any one of these may hold the key to success of effective highway safety adjudication. Yet, both traditional countermeasures in common use and new and innovative countermeasures being developed must be proven effective. Evaluation of countermeasures should be included in your efforts to reduce injuries, deaths and damage on our highways.

Footnotes

1) Blumenthal, Murray and H. Laurence Ross, Two Experimental Studies of Traffic Law, Volume I: The Effect of Legal Sanctions on DUI Offenders, Final Report, Department of Transportation, National Highway Traffic Safety Administration, February 1973. At times in the study, the researchers found prior DUI's recorded in the Motor Vehicle Department's records although the sentencing judge was unaware of the prior charge.

2) Ibid., p. Xii.

3) Ibid., pp. 34-35.

4) Ibid., p. 59. Emphasis added.

5) Johns, Thamis R. and Edward A. Pascarello, "An Assessment of the Limited Driving License Amendment to the North Carolina Statutes Relating to Drunk Driving," The University of North Carolina, Highway Safety Research Center, April 1971.

6) Coppin, R.S. and G. Van Oldenbeek, "Driving Under Suspension and Revocation: A Study of Suspended and Revoked Drivers Classified as Negligent Operators," State of California, Department of Motor Vehicles, January 1965.

A Case History

John Williams, age 22, had been employed as a construction worker for two years. He was unmarried and lived with his family in a seven-room frame house. On Friday and Saturday evenings he often met friends in the tavern of a neighboring town 11 miles from his home where he had attended high school. During the course of an evening at the tavern he usually drank enough to raise his blood alcohol to levels defined as illegal in this state.

John was arrested twice on weekend nights after a state patrolman noticed his erratic driving. In both instances, the charges of driving under the influence of alcohol were reduced to a non-alcohol involvement. The first time, the prosecutor offered to reduce the charge and encouraged John to plead guilty. The prosecutor believed that it was necessary, whenever possible,to avoid overburdening the court's limited resources. In addition, he usually tried to avoid action that would result in mandatory license suspension, recognizing that there was no alternative transportation in the area and people depended on their cars for work, shopping and recreation. John's lawyer persuaded him to plead guilty to the reduced charge offered by the prosecutor.

A trial of the second charge resulted in the judge dismissing the DWI charge after a rather impassioned plea from John's father during the trial. The judge later cautioned John's father privately, urging him to exert more influence over John's behavior.

The highway between John's home and the neighboring town has a long history. It began as a narrow trail, but the first settlers widened it and filled in the low places with crushed rock. In 1926 it was graded and surfaced. Today, over 1,000 vehicles use the road daily. Four people have been killed and thirty injured

in crashes on the road in the past three years but no analysis was performed to determine causation. The road is patrolled on an average of four times daily by state and county police within their respective jurisdictions.

John bought his car used, three years ago. The front wheels were out of alignment, resulting in a slight pull to the left. There was less than 1/8 inch of tread on the tires. There was approximately 2 inches of play in the steering wheel. Deterioration of the muffler resulted in a seepage of carbon monoxide into the vehicle. He procured a mandatory inspection sticker from a friend who ignored the defects upon John's promise to correct them.

On Friday, January 5, at 1:22 a.m., John Williams stumbled slightly as he left the tavern and walked to his car. His blood alcohol level was .12. It had just started to snow. Three minutes after he left the parking lot, John's eyes began to close for longer and longer periods of time. Finally, his head slumped down on his chest. The car, moving 60 mph., drifted to the left across the road through the falling snow. The car crossed the shoulder and went through the ditch. John woke up just as the car was stopped by a tree eight feet from the road's edge. On impact with the tree John's body continued its forward movement against the steering wheel and the windshield, then fell back and was caught between the dashboard and the seat.

A few minutes later the crash was reported by a passing motorist to the county police. The dispatcher believed the scene to be in the area within highway patrol jurisdiction. He attempted to reach the patrol by telephone since the radio was unreliable in poor weather. He received a busy signal initially but tried about 10 minutes later and related the occurrence. The patrol arrived on the scene thirty-seven minutes after the motorist's report was received.

An ambulance was summoned and the highway patrol officer rendered first aid. The ambulance service was provided by the local mortuary and the driver had to be awakened. The ambulance arrived one hour and ten minutes later. John Williams was pronounced dead on arrival at the county hospital.

Source:

Abt Associates, Inc., Alcohol - Highway Traffic Safety for Law Enforcement Officials, a workshop manual prepared for the National Highway Traffic Safety Administration.

Discussion:

The workshop was presented to a representative group of state enforcement officials (police departments). It was concerned with the problem drinker-driver as one serious part of the traffic safety problem. The following is an abstract of countermeasures suggested specifically for use by the courts.

1) Conduct pre-sentence investigations of convicted drinking drivers. To accomplish this, the judge must coordinate his efforts with the Department of Motor Vehicles and the appropriate alcoholism rehabilitation-treatment centers. Given the necessary data, the judge can hope to select the disposition most likely to deter the problem drinker from driving again while intoxicated.

2) Provide special training for prosecutor in the prosecution of DWI violations.

3) Encourage prosecutors to proceed on DWI complaints rather than allowing them to be plea bargained to a different charge.

4) Supplement probation staff with personnel especially trained in alcohol problems.

Conclusions:

The leaders of the workshop realize their recommendations must be tempered by consideration of the economic, the political and the legal realities. Moreover, the suggestions are presumed to be implemented by the courts in a context of cooperation between the various other elements of the highway system - enforcement, administrative and rehabilitative.

Source:

Abt Associates, Inc., Alcohol - Highway Traffic Safety for Law Enforcement Officials, a workshop manual prepared for the National Highway Traffic Safety Administration.

Discussion:

The workshop was presented to a representative group of state enforcement officials (police departments). It was concerned with the problem drinker-driver as one serious part of the traffic safety problem. The following is an abstract of countermeasures suggested specifically for use by law enforcement officials.

1) Police can determine the locations, times of day, and days of week of most alcohol related crashes. Police can then increase patrols during those times and at those locations.

2) Establish a system of roadside safety checks.

   Although arrests may not be permitted during roadside checks, they can serve as a means for educating the public. Additionally, the check serves to monitor those drivers who have had their licenses suspended or revoked.

3) Train enforcement personnel in methods of detecting, apprehending, and handling intoxicated drivers.

   The International Association of Chiefs of Police, under contract to the Department of Transportation, has developed an alcohol-traffic safety curriculum for use by police instructors.

4) Expedite the policeman's court-related activities once he has arrested and charged a driver with DWI.

   a) reduce the time necessary to arraign a driver charged with DWI so that the officer is not kept away from his other duties for an excessive period.
   b) reduce the processing time of the arresting officer.
   c) encourage prosecutors not to plea bargain.
   d) instruct police in how to best present their evidence in court.

Abt Associates cont.

5) Acquire the equipment needed to detect intoxication and then train policemen to use it effectively.

6) Educate the public about the problem of the drinker-driver; for example, through a "ride-along" program where citizens join police patrols.

Conclusions:

The leaders of the workshop realize their recommendations must be tempered by consideration of the economic, the political and the legal realities. Moreover, the suggestions are presumed to be implemented within a highway system in which all elements cooperate. Yet each activity can be initiated without waiting for another agency to act.

Source:

Automobile Insurance and Compensation Study, Driver Behavior and Accident Involvement: Implications for Tort Liability, Department of Transportation, October 1970.

Discussion:

The study's third chapter, "The Limits of Driver Capability," presents research on the perceptual, conceptual, and motor skills needed by the driver to meet different driving demands on different driving environments.

The authors challenge the assumption that all drivers have it within their capacity to meet the legal standard - moving their vehicles safely from one point to another.

The perceptual element of the driver tasks - the ability to perceive any potential danger in an appropriate amount of time - is obviously essential. Visual defects therefore can be linked to car crashes. But the normal driver's visual capacity may also represent a danger. For example, the driver's peripheral vision is rather wide, but its limits force the driver to divert his attention from the road to read signs. In addition, the average driver will respond to distractions, thereby lessening the time he is concentrating on the road ahead. One study by T.W. Forbes suggests "drivers are effectively blind or partially blind to areas out of the field of clear vision...that is, beyond the 20-degree cone of clearest vision." The potential danger represented by the limited capacity of peripheral vision should be clear.

Conclusion:

The discussion above suggests only one perceptual factor that effects a driver's ability to move his car safely. The study discusses additional factors, including the problems of the individual driver in heavy traffic, moving on and off freeways, and passing. The demands of such situations may go beyond man's limited physical abilities (visual acuity and motor coordination) and his limited mental abilities (decision-making skills) to operate a vehicle safely.

Behavior cont.

The authors include a quotation from Ralph Nader's Unsafe At Any Speed:

> The limitations of human beings in coping with the increasingly complex driving task even under the most rigid law enforcement or the most ambitious education program, make it unrealistic to expect all drivers to control their vehicles perfectly all the time.

Source:

Comptroller General of the United States, "Problems in Implementing the Highway Safety Improvement Program", Report to the Subcommittee on Investigations and Oversight, Committee on Public Works, House of Representatives, May 26, 1972.

Discussion:

At the request of the House of Representatives, the General Accounting Office (GAO) investigated whether the Department of Transportation has taken all feasible action to implement a program to identify and correct hazardous highway locations. Among the more easily identifiable and correctable hazards are fixed roadside objects - wall-like bridge abutments, unyielding signposts, rigid light poles, concrete footings, and spearlike guardrails.

The effectiveness of removing hazards from specified locations is suggested by a Federal Highway Administration (FHWA) study which compared accident data one year before and one year after safety projects were completed at 446 hazardous locations. At the specified places (1) fatalities had been reduced 25 percent, (2) personal injuries had been reduced 24 percent, and (3) total accidents had been reduced to 20 percent.

Conclusions and Recommendations:

The investigation found that the program, originated in 1964, to deal with the problem of highway hazards had not been fully implemented. The following is quoted from the GAO report conclusions:

> Data developed by FHWA and various independent highway safety-related organizations demonstrate that a major effort to eliminate highway hazards could contribute materially to the Department's announced intention to make the Nation's highways as safe as possible. We believe that an opportunity exists to improve materially the Nation's traffic safety record if the Department will provide stronger leadership toward the implementation of the highway safety improvement program for Federal-aid highways.

Comptroller cont.

We believe that setting aside a specific part of highway trust funds to be used annually for the elimination or correction of hazardous highway locations would promote greater efforts by the States to improve highway safety and would give the correction of hazardous highway locations the status of a major national program in line with the growing congressional, departmental, and public concern over the large number of fatalities, injuries, and accidents that occur annually on our highways.

The degree of success of an effective highway safety improvement program is dependent on the States' developing comprehensive inventories of correctable highway hazards systematically updated through accident analysis and routinely used for developing and carrying out projects to correct the hazards in accordance with assigned priorities that would provide the greatest benefits for each dollar spent. FHWA's program guidelines, if effectively implemented, could provide reasonable assurance that funds are being used in a systematic manner for highway safety improvement.

Source:

Cramton, Roger C., "Driver Behavior and Legal Sanctions: A Study of Deterrence," in O'Day, James (ed.), Driver Behavior - Cause and Effect, Proceedings of the Second Annual Traffic Safety Research Symposium of the Automobile Insurance Institute, Insurance Institute for Highway Safety, Washington, D.C., March 19-21, 1968.

Discussion:

The author reviews the broad field of traffic regulations. Control is seen as appropriate and necessary to save lives and property. The author considers what form of control should be used to account for the countervailing values of freedom in the use of one's vehicle, efficiency in transportation, minimization of coercion and preservation of individual dignity.

The article suggests that the present system of traffic regulation may have less of a deterrent effect than expected, due to the low apprehension and enforcement levels.

One informed study found that the chance of apprehension for a violation such as speeding is generally very low. The chance of a driver receiving a citation if traveling more than 10 mph above the speed limit on a particular stretch of highway in Michigan was only 1 in 7600. Thus there is an element of chance in every traffic arrest. Assuming the public can make a reasonable estimation of the chance of apprehension, the perceived risk is so low that the deterrent effect of many traffic rules is severely limited.

There is some evidence that increased levels of enforcement reduce the total number of moving violations for offenses such as speeding. In one experiment on U.S. 101, north of San Diego, California, the state patrol was doubled on the road in 1964. Although traffic increased during the period of observation by 8%, accidents declined 12% and serious accidents declined by more than 20%. A beneficial side effect of intensified patrolling was the availability of police to respond to accidents.

Cramton cont.

Conclusions:

The role of strict enforcement is only one part of an effective program of legal sanctions. There is need for further research in the evaluation of measures for controlling driver behavior.

One area for study is the effect of enforcement levels on accidents, violations and driver behavior.

Source:

"Executive Summary of the Final Report of Multidisciplinary Accident Analysis," School of Engineering and Environmental Design, University of Miami, Coral Gables, Florida, April 1972 (prepared for the National Highway Traffic Safety Administration).

Discussion:

The study focused its investigation on the roles of the driver, the vehicle, and the environment as they interrelate in the pre-crash, crash, and post-crash phases. The researchers drew their conclusions from 40 extensive case studies.

Conclusions: (quoted in full below)

1) Accident Causation: The primary causative factors in both serious and fender-bender accidents appear to be predominantly human in nature (irresponsibility, inability, and inattention). Vehicular and environmental factors together probably do not exceed or meet human causative factors in magnitude of occurrence. However, vehicular and environmental factors are found to be contributory to accident causation and significantly related to injury causation.

2) Alcohol/Drugs: The single most involved factor in the cause of fatal vehicular crash incidents is the presence and use of alcohol or other drugs.

3) Vehicle Design: The design and construction of current vehicles is predominantly a function of social acceptance of, and demand for, inferior merchandise (e.g. a demonstrated demand for "french pastry" vehicle exteriors while ignoring crashworthiness).

4) Injury Severity/Nonuse of Restraint System: The single most related factor to increased injury severity is the nonuse of available restraint systems by vehicle occupants.

5) Occupant Protection (EA Materials/Devices): The lack of adequate occupant protection for interior impacts is still being demonstrated in collisions of late model vehicles, even with the current protection measures (EA material, devices) being required by the federal government.

Executive cont.

6) Occupant Compartment Integrity: Preliminary attempts (e.g. side guard door beam) at reducing intrusion into the vehicle occupant compartment have been helpful in mitigating injuries, but are not yet adequate (e.g. side guard door beam and support failures) in maintaining sufficient compartment integrity during the crash phase.

7) "Small" Cars: The "smaller" (weight and volume) the accident involved vehicle the more severe will be the injury to nonejected occupants.

8) Ejection: The unrestrained occupant who is ejected will, with exceptionally high probability, suffer significantly greater injuries than a non-ejected occupant.

9) Environmental: Continued lack of full compliance with HSPS 12 (Highway Design Maintenance and Construction) will result in continued high accident/injury rates due to environmental hazards. Compliance with this standard will allow for reduction of such experiences. Specifically, disregard with certain Standard 12 sections is demonstrated in current and proposed new construction.

Recommendations:

Numerous specific recommendations, numbering over 100, were made regarding the driver, the vehicle, and the environment as factors in accidents.

The full report is available from the National Technical Information Service (NTIS), Springfield, Va. 22152

Source:

Haddon, William, Jr., "A Logical Framework for Categorizing Highway Safety Phenomena and Activity," The Journal of Trauma, Vol. 12, No. 3, 1972.

Discussion:

As the first director of the National Highway Safety Bureau and now as president of the Insurance Institute for Highway Safety, Dr. Haddon has played a key role in the creation of a chart for the "logical classification and analysis of road-loss factors and loss reduction options." By dividing a problem into its component factors - human, vehicle and equipment, environment - and viewing the interactions of those parts over a time continuum, the conditions which produce losses can be better identified and countermeasures developed which are specifically aimed at those conditions.

The chart follows:

FACTORS

PHASES	HUMAN	VEHICLE AND EQUIPMENT	ENVIRONMENT
PRE CRASH			
CRASH			
POST CRASH			
RESULTS-->			

The phases are described as

- Pre Crash - In this phase are the elements which determine whether a crash will occur.
- Crash - As the crash occurs, elements in this phase determine the type and severity of damage caused to people and property.

Haddon cont.

- Post Crash - Once the crash has occurred, the recovery, treatment and repair elements in this phase influence the type and severity of the final losses in people and property.

Conclusion:

By reorganizing one's thoughts in terms of the proposed chart, it is hoped that countermeasures can be found to reduce losses. At the least, the system may encourage the problem-solver to view parts of the problem he has not considered previously.

Source:

Insurance Institute for Highway Safety, "State Held Liable for Outdated Highway Design," Status Report, Vol. 7, No. 21, Nov. 13, 1972 (The article is quoted in its entirety.)

Discussion:

The California Supreme Court has held in Baldwin vs. California, 491 P.2d 112 (1972), that a citizen can sue the state for a crash caused by the highway design which was originally considered safe, but later became dangerous because of "changed physical conditions." Previously, the court had ruled that the state was immune from such claims.

Ronald Harrison, an attorney for California's Department of Public Works, says that as a result of the decision "all public entities" can expect "a more than ordinary increase in exposure" to personal injury than other types of law suits.

The court's decision came in a suit over faulty intersection design. The crash victim, Jesse Baldwin, had stopped his truck in the northbound passing lane of a four lane highway in order to make a left hand turn at the intersection. The intersection did not have a separate left hand turn lane. His truck was struck from the rear and pushed into oncoming traffic where it was struck head on by another vehicle.

Baldwin's attorney claimed that because of an increase in the volume of traffic on the highway and a history of crashes at the intersection, the state should have corrected the hazard. Baldwin presented evidence to show that over a six year period the state Division of Highways had been repeatedly notified of the hazardous intersection.

The state argued that under the California Government Tort Claims Act it could not be held liable for Baldwin's injuries. The statute provides that an agency is not liable for injuries resulting from a plan or design if the agency acted reasonably in approving that plan or design. The state's attorneys presented evidence to show that when the plans for the intersection were approved and the intersection was constructed in 1972, it met "accepted highway engineering practices."

In deciding that the state was liable for the injuries, the California Supreme Court said that when the legislature passed the tort claims act, it did not intend to give the state unlimited, perpetual immunity. When the state knows or should have known that "changed physical conditions" have produced a "dangerous condition," it must act to correct it, the court said. The immunity statute does not allow state agencies "to shut their eyes to the operation of a plan or design once it has been transferred from blueprint to blacktop," according to the court.

The court rejected arguments from the state that extending state liability will "bankrupt public entities." The court remarked that "no fiscal disaster" has occurred in Illinois or New York - states which already follow the concept of liability for changed conditions. The court said that in many instances "inexpensive remedies, such as warning signs, lights, barricades or guardrails will be sufficient."

FEDERAL GOVERNMENT ALSO SUED

Another instance of alleged inadequate highway design has resulted in a suit, filed in the U.S. District Court for the Eastern District of Virginia, of $1.8 million against the federal government. The suit alleges that a bridge on a U.S. parkway near Washington, D.C., was constructed with "defective guardrails and supports" which did not restrain a vehicle striking them. In addition, the suit charges that when the parkway's speed limit was increased, "no changes to improve" the bridge and guardrails were made. The suit was brought as a result of a December, 1970, crash in which a station wagon, allegedly thrown out of control by a blown tire, crashed through the bridge guardrail and plunged 97 feet into a ravine. Three persons died and three other occupants were seriously injured in the crash.

Source:

Lindsey, Robert, "Low Cost Road Improvements Found to Aid Safety," The New York Times, week of April 22, 1973.

This article is quoted extensively below:

Discussion:

A 28-year-old pipefitter crashed his 1970 Ford pick-up truck at 70 miles an hour into a row of steel barrels in front of a four-foot thick concrete freeway pier here recently. But he wasn't hurt: The impact of the crash was cushioned by the 42 barrels lined up like a row of closely packed bowling pins.

The incident demonstrated how a relatively inexpensive innovation in highway safety has begun to save significant numbers of lives across the country. It also illustrated why highway design is increasingly being blamed for many of the nation's 55,000 traffic deaths each year.

Among safety experts now a movement is growing to implicate what they call faulty "highway crash design" as a major factor in the death toll and to demand changes. At the same time, courts have begun to hold road designers more responsible than in the past for the safety of their products, much as they began several years ago to hold auto manufacturers more responsible for their products.

In Kansas recently, a $600,000 judgment was awarded against the State Highway Commission to a 20-year-old youth who was paralyzed when a car in which he was riding struck a freeway bridge pier. The court ruled that the pier should have been better marked and protected by a guardrail.

Also, strong evidence is now beginning to accumulate that on highways, as in cars, relatively small steps - such as the use of the $3,500 barrel installations here can have a dramatic effect in converting what would normally be fatal accidents into minor mishaps.

The stakes for making such improvements seem to be high: According to a Government study, at least 20,000 Americans die each year in the simplest kind of accident: A driver runs off the road and hits a roadside abutment, pier, sign, tree, utility pole or other structure. Two-thirds of all fatal accidents on

Lindsey cont.

Federal interstate highways involve only one vehicle.

Federal accident studies indicate that some of the most treacherous points on interstate highways are at off-ramps and intersections - known technically as "gore areas." On the average, there are one or two accidents a year at every such point across the nation.

Because most people travel relatively fast on these superhighways, such crashes tend to be serious. Typically, engineers say, drivers changing from one channel of a freeway system to another become confused or do not react fast enough and plow into abutments or piers at the wedge-shaped intersections.

Highway researchers, led to a large extent by the Texas Transportation Institute at Texas A.&M. University near here, concluded in the late nineteen-sixties that motorists could be protected from these disturbingly frequent crashes by some sort of a "cushion."

The concept that evolved was placing in front of the "gore areas" rows of empty steel drums that would collapse in a controlled way and absorb the kinetic energy of a collision that would normally have to be absorbed by the car and its passengers. The goal was to enable persons wearing seat belts in a standard-sized car to survive a 60-mile-an-hour crash without serious injuries.

Because of a bad history of expressway accidents, and its proximity to the university, Houston late in 1968 became the first major city to use the devices extensively and has had the most experience with them.

"Of all the things you can do for safety, I don't know of any, dollar for dollar, that gives you as much results," W.V. Ward, the Houston Region's chief expressway engineer, said. A recent Federal study seems to confirm effectiveness of the cushioning techniques.

John G. Viner, a Federal Highway Administration researcher, said he had analyzed 68 accidents here and elsewhere where police reports indicated persons normally would have been killed or hospitalized. In these 68 instances in which vehicles hit the crash-cushions, there were only five deaths and 12 hospitalizing injuries, a reduction of 75 per cent.

Lindsey cont.

The devices are now in use, at least on a small scale, in at least 36 states, including New York. One Government official estimated that there were probably 500 in place now across the country, with about half having been installed over the last six to twelve months. The Federal Department of Transportation has ordered states by this summer to list all points on their legs of the interstate system where the devices could be used, and has said it plans to order installations at each of these locations.

Source:

McGuire, Frederick C., "The Understanding and Prediction of Accident-Producing Behavior," in North Carolina Symposium on Highway Safety, Volume I, Highway Safety: Anatomy of a Problem, Fall, 1969.

Discussion:

The author examines the variables which may be significant in predicting the accident record of a driver.

His study found age and sex to be the most important correlates of accident frequency - younger males are most likely to be involved in accidents. Moreover, the safer driver displayed personality characteristics which could also be seen to correlate highly with sex and age. The safer driver is seen to have interests which are intellectually oriented and more esthetic. He is less aggressive, less demanding of authority positions, and tends to deny open feelings of hostility. His family history and his current family relationships reflect a lesser degree of disruption.

Conclusions:

The accident-producer is seen as being

> younger, coming mostly from an upper socio-economic family background and presenting a personality picture of being more adventurous, ambitious and less tied to social convention.

But these characteristics, it must be remembered, exist only on the average - describing the group as a whole.

Source:

Peat, Marwick, Mitchell & Co., "Procedural and Administrative Analysis of Virginia Traffic Courts," prepared for the Highway Safety Division, Commonwealth of Virginia, October 1970.

Discussion:

The researchers studied the traffic court operations in the Commonwealth of Virginia. The report attempted to evaluate the impact of the courts on highway safety. The investigation included interviews with judges, law enforcement officials, Department of Motor Vehicles personnel, and the prosecutor's office.

Numerous recommendations were made after an analysis of the data gathered in the interviews. A selected group of suggestions will be outlined below.

1) Develop an efficient method for providing driver record information to the law enforcement agencies and courts.

When one realizes there were approximately 437,000 convictions in Virginia for moving traffic violations, the size of the problem became apparent. For proper sentencing, the court needs access to the defendant's previous record. The use of remote terminal systems tied to a central computer file is one possibility.

2) Provide up-to-date statistical information.

If the judge is to decide where to invest court resources - in terms of his time and efforts, he needs an accurate assessment of the cases before him - the number of charges, who is being charged, the nature of the charges. In this manner, he can arrange his daily docket for maximum effectiveness. He might group cases by type. He might schedule all minor offenses for one day so that these cases can be dealt with expeditiously.

Sources:

"Roles and Resources of Federal Agencies in Support of Comprehensive Emergency Medical Services," report by the National Academy of Sciences' Committee on Medical Services for the Health Services and Mental Health Administration, Rockville, Maryland.

Discussion:

The following is an excerpt.

Accidental injury and acute illness generate a staggering demand on ambulance and rescue services, allied health personnel, physicians, and hospitals for the delivery of emergency medical services. Accidental injury is the leading cause of death among all persons aged 1 to 38. Each year more than 52 million U.S. citizens are injured, of whom more than 110,000 die, 11 million require bed care for a day or more, and 400,000 suffer lasting disability at a cost of nearly $3 billion in medical fees and hospital expenses and over $7 billion in lost wages. Those requiring hospitalization occupy an average of 65,000 beds for 22 million bed-days under the care of 88,000 hospital personnel. This hospital load is equivalent to 130 500-bed hospitals. Of the more than 700,000 deaths from heart disease each year, the majority are due to acute myocardial infarction and more than one half of these deaths occur before reaching a hospital. Approximately 40 million persons seek care each year in hospital emergency departments as a result of accidents, heart disease, stroke, poisoning, diabetic coma, convulsive disorders, and many other illnesses.

Emergency medical service is one of the weakest links in the delivery of health care in the nation. Thousands of lives are lost through lack of systematic application of established principles of emergency care. Few at the site of accidental injury or sudden illness are trained in the fundamentals of restoration of breathing, control of hemorrhage, or splinting of fractures. The majority of ambulances in the United States are of the hearse, limousine, or station wagon type which are inadequate in space and equipment and are manned by individuals with inadequate training to provide essential life support. Pilot studies with better ambulance services indicate that thousands of lives can be saved and disability reduced.

Roles cont.

Many ambulances lack radio communication even with their own dispatchers. Communications rarely exist between ambulances and hospitals, so that most patients arrive at emergency departments without prior notification. Most emergency departments of the nation are not only lacking in facilities and personnel, but are overtaxed by millions of non-emergency cases for whom ancillary outpatient facilities should be provided, especially during evening hours and on weekends. In comparison with facilities for definitive care of illness, few centers of excellence for the care of the critically ill or injured exist.

Source:

Stonex, K.A., "Law, Traffic and Engineering Technology," Highway Research Board Special Report 86: A Colloquy on Motor Vehicle and Traffic Law, National Academy of Sciences - National Research Council, 1965.

Discussion:

The author, an automobile safety engineer at the General Motors Technical Center, reports that human "failures" while driving are predictable.

He believes that a realistic approach to this problem is the design of cars and highway systems to avoid the high-energy impacts of automobiles involved in accidents.

The management of the roadway system at the General Motors Proving Ground found that their test drivers were leaving the road about once every 240,000 miles. The extent of injury was left to chance depending on whether the driver ran off into a level field or collided with a tree.

The solution to preventing high risks of damage was to remove all targets - by the elimination of roadside obstacles, flattening the slopes, and rounding the ditch bottoms.

The drivers continue to leave the road about once every 240,000 miles for a variety of reasons, most involving some driver error. The now "nearly ideal system" at the General Motors Proving Ground has shown no personal injury off-the-road accident for the last 80,676,724 miles.

Source:

Tarrants, William E., "Myths and Misconceptions in Traffic Safety," American Society of Safety Engineers Journal, June 1968.

Discussion:

The article by Dr. Tarrants discusses the "nature of the concepts and methods - the myths and misconceptions - which serve commonly as the basis for most prevention efforts (in highway safety)."

One of these myths is called "The Primary Cause" and deals with the lack of data on particular causes of accidents. "For example, there is growing evidence that mechanical failures contribute frequently to accidents. Most of these are obscure and never documented, assumed by many not to occur. One reason for this lack of complete causal information is the rather limited problem-perception capability of the typical contemporary investigator. Most traffic-accident reports used for prevention purposes are prepared by law-enforcement officials who are concerned primarily with documenting evidence for legal purposes. The investigator most often concentrates on identifying law violations instead of injury causal factors."

Moreover, most accident report forms stress the discovery of a "primary cause." The investigator feels compelled to find one cause for the report which limits the questions he asks and the information he gathers. Asking what is "the primary cause" ignores the fact that accidents have multiple causes.

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